



Original Research Article

Capacity Building Needs and Measures for Developing Resilient Cassava Farmers in a Fragile Economy

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Abstract

The study was conducted in Delta State, Nigeria, and guided by two research questions. The ex-post factor research design and a descriptive survey research method were adopted on a 4-point scale to solicit the opinion of respondents on the capacity-building needs and intervention measures that are capable of strengthening cassava farmers' resilience. The population of the study was 2,423 registered cassava farmers in 364 clusters in Delta State. A multi-stage sampling technique was employed to sample 191 cassava farmer clusters for the study. A self-developed 9 and 14-item structured questionnaires were used for data collection and were validated by 3 experts. The validated instruments were pre-tested to ascertain their internal consistency using the Split-half method which yielded reliability coefficient of 0.85 and 0.91 for the two questionnaires. Data collected were analyzed descriptively, and presented as means and standard deviations. The results of the study identified understanding conflict management and resolution, understanding early warning signs, and building resilient farm structures and livelihoods among others as the capacity-building needs for developing resilience. Furthermore, the study identified mustering of political will to enforce microeconomic policy in promoting sustained cassava production, and deliberate financial support to cassava farmers among others as the measures capable of building resilient Cassava farmers in a fragile economy. The study recommended among others that cassava farmers' capacity should be built regularly and the Nigerian government should make provisions for improved cassava variety and other farm inputs supplies to farmers.

Keywords: Capacity-Building, Cassava farmers, Developing Resilience, Resilient, Fragile Economy

Introduction

In modern times, world leaders are making every available sustainable effort in solving the food crisis amidst challenges facing the availability, access, and utilization of food. Despite these efforts, Nigerian farmers', particularly cassava farmers' livelihoods are still economically

threatened. Cassava farmers are not only faced with external obstacles such as land grabbing, inter- and intra-community clashes, farmers-herders clashes, insurgencies, transport hikes, oil spillage, Covid-19 and climate-related changes not limited to flooding, drought, and bush burning, but are also exposed to economic shocks orchestrated by the fragility of the Nigerian economy (Oladunmi, 2019; Ikeoji and Agbidi 2021; UNFSS, 2021; Agbidi and Imobighe, 2022; FAO, 2022).

A fragile economy is regarded as a state of vulnerability to exposure to economic shocks. This is often characterized by poverty, insecurity (kidnapping, rape, farmers-herders clashes), deprivations to fundamental rights to ownership and control over farmland, land disputes, divided political will, youth agitations, food price hikes, fuel scarcity, power failures and declining economy (Gatto *et al.*, 2021; Ikeoji and Agbidi 2021; Agbidi *et al.*, 2022; Haken *et al.*, 2022). Fragility breeds vulnerability to exposure to shocks and this accounts for Nigeria being ranked the 16th most fragile country in the world according to the 2022 Fragile State Index report (Haken *et al.*, 2022). The relative impact of this fragility is on cassava farmers as it is the major food crop cultivated by most farm families in Nigeria.

Cassava is a popular staple food valued by many mostly in the southern part of Nigeria and the crop is grown across many family households (IITA, 2021). Some studies widely hold that cassava farmers are poor in finance and land as the majority often operate subsistence farming while a few engage in marketing the product (Anikwe and Ikenanya, 2018; Ibe and Isiwu, 2021; Oyekola *et al.*, 2021). With better-informed cassava farmers, emerging issues to avert food insecurity can be confronted with new thinking habits as reflected in quality agricultural education (Agbidi *et al.*, 2021). These habits will help cassava farmers develop measures to tackle unexpected threats to their livelihoods amidst a fragile economy.

Thus, building resilient cassava farmers would help in mitigating these external obstacles and economic fragility on their livelihood activities. Developing resilience is conceptualized as the capacity of farmers to recover quickly from shocks and intricacies during food production (Mallappa and Babu, 2022). To be resilient is simply the ability to withstand shocks. An adaptable and transformable resilient capacity building is best adapted to the local environment (Meuwissen *et al.*, 2019). Resilient measures can be developed by building the capacity of cassava farmers and ensuring that intervention actions are put in place to checkmate economic shocks. These measures are actions needed as support in strengthening the cassava farmers' resilience. These actions may include among others financial support, adequate and timely provision of improved cassava varieties, assurance of farmland and lives, and political willingness to stop farmers-herders clashes, insurgencies, and kidnapping (Ikeoji and Agbidi, 2021; Oyekola *et al.*, 2021; Agbidi and Imobighe, 2022; FAO, 2022). More so, resilient farmers are better prepared to withstand shocks (Ikeoji and Agbidi, 2021; Kumar and Babu, 2021; FAO, 2022).

Furthermore, building cassava farmers' resilience can prepare them psychologically to resist economic shocks that may affect their production and equip them with innovative approaches to improve and increase their productive capacity. Notwithstanding, capacity building should be designed to meet the felt needs of the cassava farmers who often operate in clusters (Ikeoji and Agbidi 2021). More so, cassava farmers' resilience must be developed to enable them to withstand the symptoms of a fragile economy.

Emanating from the symptoms of Nigeria's fragile economy, emerging issues are brewing because of the importance of cassava to food security leading to numerous studies. Several studies have examined the production and challenges facing cassava farmers (Ekeleme *et al.*, 2016; FAO, 2018a; Ikuemonisan *et al.*, 2018; Ikeoji and Agbidi 2021; Oyekola *et al.*, 2021) while some studies investigated the contributions of cassava to food security (Oyekola *et al.*, 2021; Kennedy *et al.*, 2019; Otekunrin and Sawicka, 2019; FAO, 2018b; Ikuemonisan *et al.*, 2018; Ekeleme *et al.*, 2016;), and government intervention and measures to assist cassava farmers (Ikeoji and Agbidi 2021; Oyekola *et al.*, 2021; Inegbedion *et al.*, 2020; Otekunrin and Sawicka, 2019; FAO, 2018b; Ikuemonisan *et al.*, 2018). Some other studies examined cassava farmers' resilience (Gatto *et al.*, 2021; Ikeoji and Agbidi 2021; Mallappa and Babu, 2021). Despite these several studies, non in a single context examined the capacity-building needs and measures for developing resilient cassava farmers in a fragile economy.

Furthermore, the increasing demand for cassava products both for domestic and industrial usage calls for concern. It seems cassava farmers cannot meet the demand for the product by the consumers owing largely to the fragility of the Nigerian economy as occasioned by economic threats to their livelihoods. It is, therefore, this concern that necessitated the study to develop a framework for building cassava farmers' resilience amidst a fragile economy.

Purpose of the Study

The major purpose of this study is to develop resilient capacity-building measures for cassava farmers amidst the fragility of the Nigerian economy. Specifically, the study seeks to:

- i. identify the resilience capacity-building needs of cassava farmers in a fragile economy; and
- ii. determine the measures capable of building resilient cassava farmers in a fragile economy.

Research Questions

- i. What are the resilient capacity-building needs of cassava farmers in a fragile economy?
- ii. What are the measures capable of building resilient cassava farmers in a fragile economy?

Methodology

The study was performed in Delta State located in the Niger Delta Area of Nigeria with the dominance of cassava as a major crop cultivated in its 25 Local Government Areas. An *ex-post-facto* design and a descriptive survey research method were adopted for the study to solicit the views of cassava farmers within the area of study. This technique was considered appropriate for the study because pre-existing variables about cassava farmers' vulnerability to the fragility of Nigeria's economy had already occurred, and so cannot be manipulated as data are collected through structured questionnaires.

The study population consisted of 2,423 registered cassava farmers in Delta State's 364 clusters (Delta State Ministry of Agriculture and Natural Resources, 2020). Slovin's sample size formula was adopted to select 191 cassava farmers' clusters. Thereafter, one cassava farmer, representing

7.88% of the total population of registered cassava farmers in Delta State, was randomly selected per cluster. The instruments for data collection titled “Resilient Capacity Building Needs in a Fragile Economy (RCBNFE)” and “Measures Capable of Building Resilient Cassava farmers in a Fragile Economy (MCBRCFFE)” contained 9 and 14 structured items that were self-developed from the reviewed literature for the study. The items on each question were assigned a Likert scale-type response option of Strongly Agree (4-point) to Strongly Disagree (1-point). The instrument for data collection was face and content validated by two experts from the Department of Vocational Education (Agricultural Education Unit) and one from the Department of Guidance and Counselling (Test and Measurement Unit) all from Delta State University, Abraka. The experts went through the instruments to confirm that they encompassed the correct items that were needed.

The reliability of the validated instruments was established by pre-testing them on 30 cassava farmers from Edo State. The internal consistency of the instruments was determined using the Split-half technique by splitting each section of the instruments into odd and even number groups. Each group's scores were gathered and computed using Statistical Package for Social Sciences (SPSS) version 26 and analyzed employing the split-half reliability tool correlated with the Spearman Rank Order Correlation Coefficient to obtain a reliability coefficient of the half test. The reliability of the entire test was then calculated using the Spearman-Brown coefficient which yielded reliability coefficients of 0.85 and 0.91 for RCBNFE and MCBRCFFE respectively.

One hundred and ninety-one copies of the questionnaire were personally administered and retrieved by the researcher with the aid of two programme personnel from the Ministry of Agriculture and Natural Resources to the cassava farmers’ cluster leaders during a one-day flag-off of the Cassava Development Programme held at the Cenotaph – Asaba, Delta State organized for cassava farmers within the State. Out of the 191 questionnaire copies distributed, only 180 copies were retrieved indicating a 94.24% return rate. Collated data were analyzed using descriptive statistics, and any Mean (\bar{x}) score greater or equal to 2.50 was regarded as *Agreed* and any Mean score less than 2.50 as *Disagreed* for each item remark.

Results

Research Question 1: What are the resilient capacity-building needs of cassava farmers in a fragile economy?

Table 1: Cassava farmers’ responses on resilient capacity-building needs in a fragile economy (n=180).

S/N	Items	Mean (\bar{x})	SD	Decision
	Build my resilient capacity on:			
1	reduction of post-harvest loss or waste	2.99	0.89	Agree
2	team work/collaborations among cassava stakeholders	3.31	0.66	Agree
3	decision-making skills amid threats	3.30	0.63	Agree
4	innovative approaches in risk management	3.34	0.61	Agree
5	disaster-risk management-control skills	3.12	0.87	Agree
6	building resilient farm structures-livelihoods	3.35	0.59	Agree
7	understanding early warning signs	3.42	0.52	Agree
8	information sourcing-management	2.97	0.93	Agree
9	understanding conflict management-resolution	3.49	0.50	Agree

Table 1 presents the Mean (\bar{x}) scores of the respondents on the resilient capacity-building needs of cassava farmers in a fragile economy with all the items ranging from 2.97 – 3.49. These values are above the benchmark of 2.50, signifying agreement that all the items are the capacity-building needs for developing resilient cassava farmers in a fragile economy, particularly in the areas of understanding conflict management and resolution, understanding early warning signs, building resilient farm structures and livelihoods, innovative approaches in risk management among others. The values of the Standard Deviation (0.50 – 0.93) showed that the cassava farmers' responses did not deviate widely from the Mean (\bar{x}) but were close to one (1) in their opinions on the capacity building needed for developing resilience in a fragile economy.

Research Question 2: What are the measures capable of building resilient cassava farmers in a fragile economy?

Table 2: Responses on measures capable of building resilient cassava farmers in a fragile economy (n = 180).

S/N	Items	Mean	SD	Decision
1	Develop rapid multiplication-resistant varieties of cassava against climatic shocks	3.51	0.50	Agree
2	Sustain-fund cassava research development activities in schools	3.38	0.63	Agree
3	Deliberate financial support to cassava farmers	3.52	0.50	Agree
4	Strengthen cassava farmers-extension agents-research institute linkages	3.48	0.54	Agree
5	Prompt distribution of resistant cassava varieties to enhance the availability of planting materials	3.51	0.50	Agree
6	Value chain development of cassava production at the cluster level	3.48	0.50	Agree
7	Enhance cluster-level processing technology in cassava farming communities	3.51	0.51	Agree
8	Mustering political will to enforce microeconomic policy to promote sustained cassava production	3.56	0.50	Agree
9	Deliberate enforcement of law order at the community level	3.48	0.52	Agree
10	Consent effort to support smart technology in cassava production	3.53	0.50	Agree
11	Invest in rural infrastructures at the farming community level	3.51	0.50	Agree
12	Mitigate measures against perennial flooding through dredging of rivers and creeks	3.50	0.50	Agree
13	Enforce social protection measures	3.48	0.52	Agree
14	Enforce anti-grazing laws at the community level	3.51	0.50	Agree

Table 2 describes the Mean scores of the respondents on the measures capable of building resilient cassava farmers in a fragile economy. All the responses ranged from 3.38 – 3.56. These values are above the benchmark of 2.50, indicating that the respondents agreed that all the items were the measures capable of building resilient cassava farmers in a fragile economy, particularly in terms of mustering of political will to enforce microeconomic policy in promoting sustained cassava production, deliberate financial support to cassava farmers, developing rapid multiplication-resistant varieties of cassava against climatic shocks, prompt distribution of

resistant cassava varieties to enhance the availability of planting materials, enhancing cluster level processing technology in cassava farming communities among others. The Standard Deviations ranged from 0.50 – 0.63 indicating that cassava farmers' responses were not far apart from the Mean but close to one another in their opinions on the measures capable of building resilient cassava farmers in a fragile economy.

Discussion

Resilient Capacity Building Needs of Cassava farmers in A Fragile Economy

The result of the study in Table 1 shows that in a fragile economy, cassava farmers need resilient capacity-building in the area of understanding conflict management and resolution, recognizing early warning signs, building resilient farm structures and livelihoods, employing innovative approaches in risk management, teamwork and collaborations, developing decision-making skills amid threats, among others. This finding aligns with an earlier study by Yaseen *et al.* (2015) which reported that the basic reason for capacity building and training is to ensure individual and organizational change. This is also in line with Ikeoji and Agbidi (2021) that capacity-building in resilience gives credence to the centrality of Agricultural education to sustainable development. This implies that applying the right capacity-building measures is capable of empowering and facilitating cassava farmers' resilience against economic fragility. Climatic shocks, food shortages, food price hikes, conflicts, clashes, and other factors are capable of weakening the capacity of cassava farmers to increase production. Therefore, resilient capacity building in the identified areas is vital to strengthening cassava farmers in a fragile economy.

Measures Capable of Building Resilient Cassava farmers in A Fragile Economy

The result in Table 2 identified the measures capable of building resilient cassava farmers in a fragile economy. These measures include mustering of political will to enforce microeconomic policy in promoting sustained cassava production, deliberate financial support to cassava farmers, developing rapid multiplication of resistant varieties of cassava against climatic shocks, prompt distribution of resistant cassava varieties to enhance the availability of planting materials, enhancing cluster level processing technology in cassava farming communities among others. This finding agrees with Oyekola *et al.* (2021) that financial support, farm equipment supplies, and the provision of the new variety of cassava were the major interventions carried out by the Nigerian government. Intervention measures have the potential to strengthen vulnerable cassava farmers to be productive despite obstacles. Interventions are necessary measures geared toward strengthening cassava farmers against economic threats to livelihood (Ikeoji and Agbidi 2021; Oyekola *et al.*, 2021; Ekeleme *et al.*, 2018; Ikuemonisan *et al.*, 2018).

Conclusion/Recommendation

In developing resilient cassava farmers in Nigeria, capacity-building is a necessary embodiment and key element of Agricultural education for achieving food security in a fragile economy. In doing this, intervention measures are also vital in creating assurances for the farmers against unwanted circumstances. Therefore, understanding, managing and resolving conflict, identifying early warning signs, building resilient farm structures, and collaborations among others are the resilient capacities needed by cassava farmers to make them capable of withstanding vulnerability to economic fragility. Likewise, measures such as mustering of political will to enforce microeconomic policy in promoting sustained cassava production, deliberate financial support to cassava farmers, developing rapid multiplication of resistant varieties of cassava against climatic shocks, prompt distribution of resistant cassava varieties to enhance the availability of planting materials, enhancing cluster level processing technology in cassava

farming communities among others are capable of sustaining and supporting productive capabilities of cassava farmers in a fragile economy.

Having identified the capacity-building needs and intervention measures capable of strengthening cassava farmers against fragility in the Nigerian economy, it is recommended that, cassava farmers' capacity should be built regularly to meet emerging challenges in the future. The government of Nigeria and research institutions should develop, multiply and distribute improved varieties of cassava that can withstand extreme climatic and anthropomorphic shocks such as floods, bush burning, and drought. The gap between cassava farmers, extension agents and research institutions should be bridged to enhance communication. Since farmers are constantly faced with challenges, the government of Nigeria should implement policies that socially support farmers facing economic threats to their livelihoods. The government of Nigeria should also provide cluster cassava-processing facilities to farming communities to aid farmers during periods of economic fragility.

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